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GENERAL NOTES.

The toll of deaths among noted astronomers has been an exceedingly heavy one during the past few months.

Dr. SETH C. CHANDLER, for a long time editor of *The Astronomical Journal*, whose life and work during the past quarter century has been closely linked with astronomical progress in America, died on December 31, 1913, after a brief illness. A brief account of his work appears upon another page.

We regret also to record the death of Professor WINSLOW UPTON, on January 8, 1914. Professor UPTON was for thirty years head of the Department of Astronomy and Director of the Ladd Observatory of Brown University, and is well known to American astronomers and students through his "Star Atlas," and by his contributions to astronomical literature.

We note in *Nature* the announcement of the death of the Rev. EDMUND LEDGER, at the age of seventy-two. For thirty-three years he was professor of astronomy at Gresham College, London, and was the author of several popular works and articles on astronomical subjects.

Dr. JULIUS SCHEINER, Chief Observer at the Astrophysical Observatory of Potsdam, died on December 20, 1913, at the age of fifty-six. Among Dr. SCHEINER's many contributions to astrophysics, perhaps the most generally known is his "Stellar Spectroscopy." An account of his work will be given in our next number.

Dr. LADISLAS WEINEK, Director of the Observatory of Prague, died on the 12th of November, 1913, after a very short illness, at the age of sixty-six. Dr. WEINEK was a member of many scientific societies, and is perhaps best known for his publications in the field of lunar topography. The major part of Volume III of the *Publications of the Lick Observatory* is composed of the beautiful drawings of lunar formations made by Professor WEINEK from a study of negatives taken with the 36-inch refractor. As one example of the amount of careful and painstaking work which he employed in making these drawings, the beautiful plate of Copernicus alone necessitated

no less than $224\frac{3}{4}$ hours of labor, distributed over 141 separate days.

SIR ROBERT BALL, Lowndean Professor of Astronomy at Cambridge, one of the most widely popular and well-known of modern astronomers, died on November 25, 1913. An account of his life is given by Mr. HECTOR MACPHERSON, JR., in the January number of *Popular Astronomy*, and from this article we quote the following extracts:—

ROBERT STAWELL BALL was a native of Dublin, where he was born on July 1, 1840, and where his father, Dr. ROBERT BALL, was a well-known naturalist. . . . In early manhood he became devoted to astronomy, and in 1865 he received his first appointment—that of astronomer to the Earl of Rosse at Birr Castle, Parsontown, Ireland, where he worked for two seasons. In 1874 he was made Royal Astronomer for Ireland, which carried with it the directorship of the Dunsink Observatory. In the same year he commenced his career as a public lecturer on astronomy, and in 1886 he received the order of knighthood. . . . He continued as an active lecturer and author on astronomy till within a few years of his death, when he abandoned public lecturing, and practically retired from active work on account of failing health.

SIR ROBERT BALL's services to astronomy were of two kinds. He was (i) an original investigator and (ii) a popular writer and lecturer. In both spheres he achieved distinction.

(i) His original work was chiefly accomplished while he was Director of Dunsink Observatory and Royal Astronomer of Ireland. Here his main work was a search for stars with large parallaxes. . . . BALL was a mathematician of considerable power. For twenty-five years he grappled with the "Theory of Screws." The results of his investigations were summarized in memoirs communicated to the Royal Irish Academy from 1872 to 1897.

(ii) In 1886 BALL's career as an independent investigator in astronomy came practically to an end. He published in that year "The Story of the Heavens," and commenced his career as a popular writer on the subject; . . . in the role of popular lecturer and writer he achieved distinction of no mean order.

He was a prolific writer; among the works which appeared from his pen in rapid succession, the following may be named: "The Elements of Astronomy," "The Story of the Heavens," "Star Land," "Time and Tide," "In Starry Realms," "An Atlas of Astronomy," "In the High Heavens," "Great Astronomers," "A Primer of Astronomy," "The Earth's Beginning," "Spherical Astronomy."

As a lecturer he visited the United States and Canada. In addition, he traveled practically all over the United Kingdom. It has been truly

said of him that "There is no important town in England, Scotland, Ireland, or Wales where Sir ROBERT BALL has not lectured and in most cases lectured often. At a very modest estimate, over one million people have heard him lecture."

It was his peculiar function, then, to impart to the amateur and to the unlearned listener the wonders and mysteries of astronomy; and he certainly succeeded in making his science popular. Thus his death is mourned by a wider circle than those of greater and less popular men. . . . He will long be remembered as the expounder of the science to the unlearned, and many an astronomer owes his first interest in his science to the popularizing work of the genial Irishman who has passed into the Great Beyond. Astronomy needs both its students and its popularisers. Science has a duty to the mass of mankind; and this duty some one must perform. In this sphere Sir ROBERT BALL nobly performed the task which he set himself."

Prizes Awarded by the French Academy of Sciences in December, 1913.—The Lalande prize was awarded to M. J. BOSLER for researches on abrupt variations of terrestrial magnetism and their relation with disturbances appearing on the Sun; the Valz prize to Professor ALFRED FOWLER for his spectroscopic work, and, in particular, for his contributions to our knowledge of the origin of certain bands in the spectra of sun-spots, comet tails, and late-type stars; and the De Pontécoulant prize to M. K. SUNDMANN for his studies on the problem of three bodies.

In addition to these distinctly astronomical prizes, two of the general prizes offered by the Academy were this year awarded, the one to an astronomer, the other to physicists whose work has contributed directly to astronomical advance. The Wilde prize was awarded to M. A. BONELLY for his life work in astronomy; the Pierson-Perrin prize was divided, 2,000 francs each, being awarded to M. CH. FABRY and M. H. BUISSON for their precise determinations of the wave-lengths of spectral lines by means of the interferometer, and 1,000 francs to M. RUDOLPHE SOREAU for a treatise entitled "*L'Hélice Propulsive*."

Among the grants made from the "Fonds Bonaparte," was one of 4,000 francs to M. LE MORVAN for the publication of a photographic atlas of the Moon, and one of 2,000 francs to M. H. ABRAHAM for the determination of velocity of propa-

gation of Hertzian waves between Paris and Toulon. It is stated that in this latter research a new galvanometer, capable of recording the time of passage of a train of waves to 1-40,000 of a second, will be employed.

A New Observatory.—We learn from *The Observatory* for December that Mr. J. H. WORTHINGTON'S private observatory at Four Mark, near Alton, Hants, England, was formally opened on Saturday, November 8, 1913. The equipment includes a 10-inch Cooke refractor, a 20-inch reflector, and smaller instruments.

In the Oxford Notebook of the same issue of the *Observatory* it is pointed out that Trinity College, Cambridge, has furnished ten members of the staff of the Royal Observatory at Greenwich since its foundation; Jesus College, Cambridge, has furnished three, including the recently appointed chief assistant, Mr. H. S. JONES, and no other college more than one.

According to Bulletin 538 of the Harvard College Observatory, *Titan*, the brightest satellite of *Saturn*, has been found to be variable. This conclusion is based upon a discussion of the observations by the late O. C. WENDELL. Reduced to mean opposition distance, the light varies regularly from magnitude 8.53 to 8.77, the period coinciding with the time of revolution of the satellite.

It will be recalled that *Japetus*, the eighth satellite of *Saturn*, exhibits the same phenomenon, the range of brightness, however, being about 1.78 magnitude, from 10.40 to 12.18. As Professor PICKERING says, the explanation in both cases is probably that one side of the satellite is darker than the other.

The following note is taken from *Science* for November 28, 1913: "The new seven and one-half-inch photographic telescope was placed in position in the Memorial Observatory of the Nantucket Maria Mitchell Association on November 15th, the mounting and final adjustment by Alvan Clark & Son's Corporation completing the work. The lens was made by T. Cooke & Sons, York, England. It has been subjected to vari-

ous tests at Harvard College Observatory by the Director, Dr. EDWARD C. PICKERING, personally, and by his several assistants who have given it careful attention. Rev. JOEL H. METCALF, whose astronomical discoveries by means of photographs are well known, has also carefully examined its work. By all of these it is pronounced good. The Nantucket Observatory is now well equipped for photographic study of asteroids or other heavenly bodies."

Miss MARGARET HARWOOD has been appointed to the Fellowship of the association for the year beginning June 15, 1914. This will be the third year of her service.

Readers who are specially interested in the progress of observations on *Mars* should not miss Professor W. H. PICKERING's "Monthly Reports on *Mars*," the first of which was published in *Popular Astronomy* for January, 1914.

The following French verses, quoted in a review in the *Bulletin* of the American Mathematical Society, may interest those who find difficulty in remembering the ratio of the circumference of a circle to its diameter. Count the letters in each word separately, and write the sums in order. They will give the ratio correct to thirty decimals—3.141592653589793-238462643383279:—

"Que j'aime à faire apprendre un nombre utile aux sages!
Immortel Archimède artiste ingénieur
Qui de ton jugement peut priser la valeur!
Pour moi ton problème eut de pareils avantages."

The American Association for the Advancement of Science held its sixty-fifth meeting at Atlanta, Georgia, from December 29, 1913, to January 3, 1914. Professor E. C. PICKERING, the retiring president, delivered the annual address, taking for his subject "The Study of the Stars." The address is printed in full in *Science* for January 2, 1914.

The Astronomical and Astrophysical Society of America met at the same place and time, several of its sessions being joint sessions with Section A of the Association.

Mr. E. W. MAUNDER, for many years superintendent of the Solar Department of the Royal Observatory at Greenwich, retired on November 6, 1913, in accordance with the regulations, having completed forty years of service in the institution. In addition to his technical papers, Mr. MAUNDER has written many articles and books of interest to the general reader, one of the most recent being his volume discussing the problem of "Life on Other Worlds." The *Observatory* recalls attention to the fact that he was also the founder of the British Astronomical Association.

Just as this number of the *Publications* is going to press we learn from press dispatches the news of the death of Sir DAVID GILL, and are compelled to add one more name to the already too long list of great astronomers who have recently passed away.

Sir DAVID GILL was nearly seventy-one years of age, and for nearly forty years had been a commanding figure in the astronomical world. The list of his published papers and the various astronomical and geodetic investigations which he inaugurated and carried thru would in itself be a long one. He will doubtless be longest remembered for his long and valuable services, both as an investigator and as an executive while in charge of the Observatory of the Cape of Good Hope.

He was a member of many learned societies, and the recipient of many honors and medals; our members will recall that he was the third to be awarded the Bruce Gold Medal of the Astronomical Society of the Pacific.

He retired from active duties in 1907, but continued to manifest almost until the day of his death the same keen and vivid interest and the same wise counsel and sane judgment in astronomical problems.